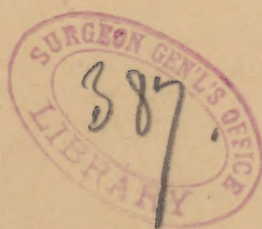


Tuckerman (Fr.)

On the gustatory organs of  
Erethizon dorsatus.





## On the Gustatory Organs of *Erethizon Dorsatus*.

BY FREDERICK TUCKERMAN,

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Quite recently I received a fresh tongue of this species. I placed the organ for a few days in a mixture of Müller's fluid and alcohol, and afterwards transferred it to ordinary spirit, where the hardening was completed.

*General Description of the Tongue.*—The tongue is 76 mm. long, 19 mm. wide, and 16 mm. in thickness. It is free from the frænum for 32 mm. The fore part of the organ is compressed laterally, and terminates in a more or less pointed apex. The posterior dorsal region is somewhat roughened by verrucose elevations, and is impressed anteriorly by a slight mesial groove from the gustatory area backwards. Near the base is a median ridge with a shallow groove on either side. The fungiform papillæ are normal in structure, but few in number. There are a few large ones, disposed in lineal series, above the line of junction of the upper surface and sides. At the posterior part of the papillate surface are two circumvallate papillæ situated one on either side of the median line. The two papillæ are 16 mm. from the base of the tongue, and equi-distant from its lateral margins and from each other. Placed between them are two small slit-like apertures, which may have at some period contained bulb-bearing ridges. The papillæ foliatæ lie well down on the sides of the tongue, their posterior limits being some 4 mm. anterior to the circumvallate gustatory area.

*The Circumvallate Papillæ.*—These papillæ are about 1.45 mm. in breadth, and 0.60 in height. They bear on their upper part a great number of secondary papillæ overlaying, which is a thin stratum of stratified pavement epithelium. Serous glands are plentiful both within the bodies of the papillæ and around their base. Their ducts open into the trench, especially at its deeper part. The taste-bulbs, which are far from numerous, are disposed in a somewhat irregular belt around the base of the papilla. They average about 0.054 mm. in length, and 0.024 mm. in breadth.

*The Papillæ Foliatæ.*—The foliate papillæ are about 7 mm. in length. Each papilla consists of fifteen or sixteen fairly symmetrical folds, and each fold bears at its upper part two or more secondary papillæ, the spaces between which are filled to a common level with epithelium. The furrows separating the folds or ridges are narrow, and 0.45 mm. in depth. Serous glands are abundant about the base of the folds, and their ducts usually open at the bottom of the furrows. The taste-bulbs are not numerous, and are very irregular in their disposition. They average 0.048 mm. in length, and 0.027 mm. in breadth.

In the fungi form papillæ the taste-bulbs seem to be relatively more numerous than in the gustatory areas proper of the tongue. They are situated at the upper part of the papilla, and are usually placed obliquely to its long axis, with their apices directed upwards and outwards. The basal end of the bulbs generally touches the mucosa. In transverse sections of these papillæ the component cells of the bulbs could frequently be distinguished without difficulty, and in one bulb I counted twenty distinct cells. More than half of the cells were grouped about the axis of the bulb, and were doubtless sensory in function.





### Selecting a Microscope.

By G. S. WOOLMAN,

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There is a simple instrument which, with its three lenses combined, has a power of thirty-three diameters, which sells for \$3.50. With it can be seen many of the larger animalculæ in pond water, the scales from a butterfly's wing, pollen-grains from plants, and thousands of other objects not visible to the naked eye. From \$3.50 the prices for microscopes range up to \$350 and \$400. There are many different styles and grades, a very common mistake made by persons attempting to select a microscope is to judge of the excellence of an instrument by the amount of its magnifying power. No object should be viewed with a power greater than that required to show its structure, and if that can be done with thirty diameters it is, to say the least, unnecessary to use one hundred. This is especially the case with low-priced instruments, where the apertures of the objectives are small and the connections not so exact as in the higher grades, rendering them more liable to give false impressions of objects. Moreover, it is absolutely impossible to view opaque objects satisfactorily by the reflected light of cheap compound microscopes. For those who wish to dissect flowers and insects for examination a simple instrument is better.

In selecting a microscope the essential points to be observed are that the lenses show objects clear and well-defined, that the stand be of good material and workmanship, and that there be no lateral movement in the adjustments of the focus. Further, that the focus be instantly changeable when desired, and that it have a joint for inclination. As to the different kinds of microscopes. The simplest, of course, is the single glass, such as is used by watchmakers and engravers, and the common pocket glass with from one to three lenses. The simplest microscope with a stand is the one mentioned above for \$3.50; with its three lenses combined it has a magnifying power of 33 diameters. It packs in a box that acts as a base for the upright brass stem. With it comes an animalculæ cage, a pair of brass forceps, a watch-glass, two plain glass slips, and a prepared object. The school microscope is similar, but works easier, and is better adapted for school purposes. Of the compound microscopes, one sells for \$2.50, which is the simplest. It is of polished brass with one piece and one object-glass, magnifying, when combined, about 40 diameters (or 1,600 times), the power being calculated by squaring the diameter.

A powerful instrument for household use, with its two object-glasses, magnifies from 30 to 100 diameters, and ranges in price according to size and quality from \$5 to \$12. For ordinary use, an amateur microscopist can buy an instrument for from \$23 to \$30 which will answer his every purpose. Such a microscope will have a stage with adjustable spring clips, a revolving diaphragm with four apertures beneath the stage, and a concave reflecting mirror for use under or above the stage. It can magnify 165 diameters, and, with the addition of a one-fifth object-glass, this can be increased to 350 diameters. For students in histology and vegetable anatomy there are instruments that range in price from \$50 to \$400, and when one of the cheapest is furnished with condenser, polariscope, camera lucida, spot lens, zoophyte trough, live box, and forceps, it is complete for almost any investigation.



